

# DEVELOPMENT OF HELICOPTER CAPABILITIES IN THE U.S. ARMY DURING THE KOREAN AND VIETNAM WARS

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MASTER OF MILITARY ART AND SCIENCE  
Military History

by

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## ABSTRACT

DEVELOPMENT OF HELICOPTER CAPABILITIES IN THE U.S. ARMY DURING THE KOREAN AND VIETNAM WARS, by Maj Denys Soboliev, 76 pages.

The Vietnam War was the first conflict with a large helicopter involvement from the U.S. side. It was the biggest vertical capability use on the battlefield ever and was innovative and effective. It was unique on the battlefield, especially when enemy did not have any similar air mobility and sky cavalry capabilities. One can be surprised when understands how long it took to the Army to prove the necessity and develop this innovative capability. During the Korean War the Army had used very limited number of helicopters as logistical and transportation tools. The Army introduced a combat role of helicopters only in the Vietnam War. So, why did it take so long to the Army to obtain organic combat helicopters as an integral part of its capabilities?

In this thesis the author addresses history of vertical capability incorporation into the Army during 1950–1973. The author uses parallel comparison of the Army and the Marine Corps' approach to the new helicopter capability. It provides clear picture of who was better and why, what challenges they met and how the challenges could be mitigated or overcame. This study provides a great example of a different approach to military innovation.

## ACKNOWLEDGMENTS

I have background in the helicopter aviation and I am interested in the history of rotorcrafts. When I came to the U.S. as a Command and General Staff College's student, I decided to do a research of the great story of the U.S. helicopters. I decided to narrow my thesis down to the Korean and Vietnam Wars period. Not being a native English speaker, it seemed challenging to cover a lot of addition material according to my research. Moreover, putting my thoughts on paper became even more challenging. This thesis would not have been possible unless the help, proofreading and motivation from the committee. I would like to thank Mr. Wilburn Meador, Dr. Jonathan House, and Mr. Stephen Brown for their sincere help. With the direction of my committee, I gradually distilled the essence of the study and put the words on paper. The constructive encouragement of these gentlemen improved my research methods, writing, and provided motivation to complete this work and to think about its possible development and even practical application for the Ukrainian Department of Defense.

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## CHAPTER 1

### INTRODUCTION

#### Overview

The Vietnam War was the first conflict with a large helicopter involvement from the U.S. side. It was the biggest vertical capability use on the battlefield ever and seemed to be very innovative and effective. It was unique on the battlefield, especially when the enemy did not have any similar air mobility and sky cavalry capabilities. One can be surprised when understands how long it took to the Army to prove the necessity and develop this innovative capability. During the Korean War the Army had used very limited number of helicopters as logistical and transportation tools. The Army introduced a combat role of helicopters only in the Vietnam War. So, why did it take so long to the Army to obtain organic combat helicopters as an integral part of its capabilities?

#### Primary Research Question

Why did it take so long for the Army to develop its organic helicopter capability? The primary purpose of this question is to understand the reasons that prevented or slowed down vision and necessity of helicopter capability development. Heavy reliance on the Air Force for the development and procurement of helicopters, lack of priority and mission, absence of a controlling organization were among the reasons that slowed down vertical capability progress in the Army during 1950s. The Korean War had dramatically changed perceptions about warfare in the nuclear age and reprioritized the capabilities needed to be developed stressing on atomic weapons and strategic strike capabilities. Helicopters were not a priority.



### Secondary Research Questions

Secondary research questions will provide a deeper understanding and support answer of the primary research question. For a better understanding of the Army approach to the helicopters, there is a comparison with Marine Corps' approach. Parallel description of two services' innovation approaches provides clarity of progress of each.

The secondary questions in this thesis are:

1. What were the primary reasons for a slow development of helicopter capability in the Army?
2. What was a global security situation in 1950s and 1960s and how did it influence development of helicopter capability in the Army?
3. What was a National government and military leadership's vision of the perspective vertical capability, how did it influence helicopter development?
4. What was different in the Army and Marine Corps' approach to the vertical capability implementation?
5. Why did the Marine Corps manage to incorporate helicopters effectively in its structure in late 1940s - beginning of 1950s?
6. What attitude did the Army and Marine Corps have to innovation? How did these attitudes influence helicopters?

The purpose of these secondary research questions is to frame the primary question to better understand the complicated issues of political, military and economic situation of that time in relation to employment of new vertical capability in the forces. The analysis of questions is not structured in sequential order. This research identifies

specific reasons for slow vertical capability employment in the Army and provides understanding of the overall process chronologically.

First of all, one must understand reasons for slow helicopter development in the Army. Only major reasons will be addressed. This question specifically seeks to understand the influence of these reasons on the retardation of innovation in the Army overall and for helicopters particularly.

Second, the impact of the Korean War on the assumptions about warfare in the nuclear age was terrific. It changed priorities and the structure of force deployment and capabilities. The Interwar period will be considered to be a peace time, nevertheless it was clear vision of a high probability of force employment in Vietnam in the future. Moreover, the Cold War provided stimulus to stay military alert and ready. This question specifically seeks to understand how these situation influenced helicopters destiny in the Army.

Third, one of the prime reasons for a slow development of helicopters was a lack of vision and support from state, military and Army level leadership. No vision gave no mission, which resulted in a low priority and limited budget allocation. This question specifically seeks to understand leadership's influence on helicopter development in the Army.

Fourth, parallel comparison of two services at the same period provides better understanding of objective complexity of problems with helicopters and specific challenges each service had individually. The Marine Corps acts as an example of innovation friendly approach and manages to adapt vertical envelopment in late 1940s—beginning of 1950s. It brings a lot of questions to the Army, which could not do the same

during 1950s. This question specifically seeks to compare and contrast each service's strong and weak points towards helicopters incorporation in its structure.

Fifth, the last two questions continue a previous one and address the specifically innovative culture of Marines and the urgent necessity to replace or dramatically modernize classic amphibious assault, which appeared to be unfeasible in the age of nuclear capabilities. The Marines' innovative culture contrasts with the Army one, however, the Army was innovative enough during 1950s. An absence of mission for helicopters was the reason for a slow approach during 1950s.

### Assumptions

Assumptions are ideas or concepts that the researcher believes to be true and are necessary in order to continue with the research. They must be clarified to enhance understanding within the bounds of this study. There are a number of assumptions to discuss in order to frame the research as it applies to the primary research question, "Why did it take so long for the Army to develop its organic helicopter capability?"

The first assumption says that there was a mission for helicopters and need for them on the battlefield after the Korean War. This conflict was among the first stages for the helicopter capability recognition. Helicopters showed their value on the battlefield. However, there was a very limited use of helicopters in a combat during the war. Hovering vehicles were recognized as logistical, medical evacuation, and transportation tools. Nevertheless, the values were recognized and the vision for helicopters could be developed. Unique vertical capability was extremely useful in the rough jungle terrain and poor road network of Korea.

Next assumption is following: helicopters will be used in the future, which makes study relevant. Helicopters have already been extensively used for more than six decades. There is a tendency for unmanned aircraft use in the future, which faces several conceptual problems (unmanned aircraft carrying people, jamming of signal) and has limitations. It means that even if drones partially replace helicopters in the future, there will be certain field for classic helicopter employment.

Here is the last assumption. There must be a vision about new capability's mission to develop it and integrate into the force structure. One needs to understand where, how, and why it is necessary to use something new. What kind of benefits will it bring? Understanding gives a vision and then brings a mission for a new capability. Following steps usually are resources allocation and development.

### Definitions

The following key definitions and terms provide fidelity and clarity when used in the context of this thesis. They provide a common understanding of certain concepts presented to the reader.

Air mobility - the ability to transport military troops and supplies in and out of combat areas by means of aircraft.<sup>1</sup>

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<sup>1</sup> Merriam-Webster, "Air mobility," accessed 7 April 2016, <http://www.merriam-webster.com>.

Sky cavalry (usually air cavalry) - a light plane or helicopter reconnaissance unit often functionally integrated with surface cavalry units. In this particular study, the author refers to sky cavalry as helicopters.<sup>2</sup>

Pentomic - refers to a structure for infantry and airborne divisions adopted by the U.S. Army in 1957 in response to the perceived threat posed by tactical nuclear weapons use on the battlefield.<sup>3</sup>

Pentomic Division - a public relations term designed to combine the concept of five subordinate units ('penta') with the idea of a division that could function on an atomic or nonatomic battlefield.<sup>4</sup>

### Limitations and Delimitations

Limitations and delimitations are existing or self-imposed factors that limit the scope of research and analysis. Limitations are potential weak points while delimitations set the boundaries and direct the focal point of the thesis and can be self-imposed.

Primary limitations of the study are limited time of about six month to conduct the research, and author's bias of being a helicopter pilot in the post-Soviet Union country. 23-years' time gap of the study will eliminate details and force author to focus on a big

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<sup>2</sup> Merriam-Webster, "Sky cavalry," accessed 7 April 2016, <http://www.merriam-webster.com>.

<sup>3</sup> Wikipedia, "Pentomic," updated 14 July 2016, accessed 7 April 2016, <http://en.wikipedia.org/wiki/Pentomic>.

<sup>4</sup> Wikipedia, "Pentomic Division," updated 14 July 2016, accessed 7 April 2016, <http://en.wikipedia.org/wiki/Pentomic>.

scale of events, problems, and outcomes. Leadership influence analysis excludes National leadership level and focuses only at the department of defense and lower levels.

The primary delimitation in this study is a specific time period from 1950 until 1973. Next delimitation is a focus on both the U.S. Army and U.S. Marine Corps' approach of helicopters incorporation in their structure.

The thesis title and primary research question refer to the U.S. Army; however, for the purpose of clarity and better understanding the author has conducted research on U.S. Marine Corps to compare the approach of two services in the helicopter capability incorporation in their structure during the same period. The title and primary research question focus on the Army because it was and still is the biggest employer of helicopters in the U.S. military.

### Significance of the Study

In this study the author consolidates the U.S. Army approach to helicopter aviation innovation since the Korean War, when the helicopter's beneficial and unique experience was widely recognized in the military. The study concludes with the end of the Vietnam War, which served as an example of new, unique, and massive use of vertical capability during the conflict. This time gap provides an overwhelming understanding of how effective the process went and what could be done in a different way. The study provides a close look and comparison on innovation in the two services, which can be used as an example to current and future decision makers and particular capability developers. Relevancy of new capabilities such as drones, submarine drones, cyber capabilities are still questionable. One can refer to the study as a good example of

*painful* approach that prevented the Army from rapid innovation, which resulted in a great limitation of vertical capability during the 1950s.

## CHAPTER 2

### BACKGROUND

#### Why Does the Author Conduct This Study?

The author of the study has his background in the Army Aviation of Ukraine as a helicopter pilot. His occupation and professional curiosity brought him to the story of helicopters in Vietnam. This topic is well covered by press and there are numerous books addressing the war as well. While being a pilot in a post-Soviet Union country, he decided to conduct research about this period of the U.S. helicopter triumph on the battlefield. The author decided to understand how the U.S. managed to develop the largest military helicopter capability in the world, and this idea was the beginning for thesis development. During the research the author decided to cover a much greater period than he had intended in order to understand roots and early years of helicopter employment in the U.S. Army. Subsequently, the study was focused on the 23-year period of helicopter capability development since the Korean War. Moreover, for better understanding of the Army progress, the author decided to choose a parallel comparison with the U.S. Marine Corps' vertical capability employment.

Why Vietnam? It was the first and the biggest helicopter war. One can admire the scale of the vertical capability use in the conflict. Two principal units were introduced on the battlefield and became iconic: 1st Cavalry Division and 1st Aviation Brigade. In 1965 1st Cavalry Division was activated and had alone 434 helicopters; by 1968 it could provide a lift for an entire division to achieve strategic and tactical surprise. It had sufficient numbers of organic aviation and was truly airmobile. In 1966, 1st Aviation Brigade was activated and became the largest Army aviation command with a strength of



about 25,000 officers and men. This brigade was bigger than the entire air forces of most countries.<sup>5</sup>

Helicopters were and still are the keystones to airmobility. Their uniqueness was proved again in the Vietnam War. Nevertheless, there still have been many anti-supporters of vertical capability, why tried to prove its limitations of ton-mile capacity, cost, vulnerability and complexity of design comparing to fixed-wing capability. However, helicopters had their unbeatable advantage – there was no aircraft that could possibly replace them in the majority of its missions. They were unique in the following tasks: positioning of forces and resupplying them on the restricted terrain such as mountains, jungles, river deltas, marshes; evacuation of wounded soldiers from chimney landing zones in the jungles, surrounded by triple-canopy forest trees; recovering of downed aircraft from the jungles; conducting a vertical assault of entire division.<sup>6</sup> The author addresses this study of his beloved vertical capability to helicopter zealots, leaders who seek innovation and changes, to those men proving the necessity of force modernization and innovation.

### Military and Innovation

In this study, the author focuses on the innovation of helicopter capability in the Army and the Marines explaining how this process went and what were the challenges. Looking at the broader picture of innovation overall, one can consider that it can only

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<sup>5</sup> John J. Tolson, *Airmobility 1961-1971* (Washington, DC: Department of the Army, 1973), 201, 209.

<sup>6</sup> Ibid., 204.

effectively occur on the bigger scale during the periods, when nation is at war. It is partially true and the process goes much easier when there is a vital necessity for the particular capability. Countries fight wars with the capabilities they have at hand and not with desired or perspective ones. So, that explains the need to have continuity in the innovation process during the war and peacetime as well. The process cannot be self-guided. There must be a certain pattern of how it happens. Usually, the will of the national leadership, which is based on deep understanding of the most recent conflicts and current possible threats, is a precondition for a military organization to innovate during peacetime. Historical examples can encourage effective innovation of the nature of war and the way that organizational behavior is properly addressed and analyzed. Nevertheless, even a deep understanding cannot offer a clear way for military innovation. One can analyze, guess and the time will show the way how it will appear in the future.

To understand threats, countries need to analyze constantly the global situation: economic trends, chock points, conflicts of interests. Nobody can fight without understanding of what is going on. Each country has its intelligence and analytical institutes to *digest* information and produce expectations and predictions. Then the national leadership selects an action or develops a strategy.

As a next step, the national leadership takes a decision to develop the military capabilities within desired military actions to balance an indicated threat. The national economy will limit military spending and force leadership to delineate international policy and sphere of influence. Moreover, the economy often limits the ambitions of countries and splits them into global, regional or third role players. There is a famous saying: Prepare for war if you want to live in peace. Money first! Nevertheless, a

reasonable spending of the military budget is a key to developing desired capabilities in the most efficient way. There is no country in the world that can develop all military capabilities equally and be the best in everything. It's just impossible! There are examples in the study of budget prioritization according to national policy. The U.S. Air Force was responsible for all helicopter development and procurement for the Army. However, the Air Force had long-range strategic bombers and jet fighters as their priorities. That is why the Air Force allocated the majority of the limited budget for desirable capabilities.<sup>7</sup>

The lack of a sense of urgency is the reason for procrastination or refocusing: it's not a threat today, so we can still wait and spend money for something else. Military innovation is not a single step, but many steps that bring constant results in never-ending process of change of the nature of warfare, doctrine and technology.<sup>8</sup> Even when a state has enough resources, there still is a need for time to develop a technology or a capability. Thus, a reasonable threats-based approach in conjunction with a strong economy is the precondition to develop military power and innovate during the period with the lack of urgency and motivation, which is called peacetime.

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<sup>7</sup> Christopher Cheng, *Air Mobility: The Development of a Doctrine* (Westport, CT: Greenwood Publishing Group, 1994), 76.

<sup>8</sup> Macgregor Knox and Williamson Murray, *The Dynamics of Military Revolution* (Cambridge, UK: Cambridge University Press, 2009), 159.

## Early Years of Helicopters

Lessons learned from history provide building blocks to understand the future of war. An army that does not look back in history and does not recognize the lessons of the past has increased chances to lose in the future. Army aviation as a part of the United States military should develop its doctrine and organizational structure based on this understanding. As technology improved, helicopters emerged in the military in the beginning of 1940s and brought a unique vertical capability on the battlefield. One can compare this innovation with the transition in the infantry from animal mobility to mechanization. Helicopters opened a new operational domain and became a truly organic capability of the Army.

The first helicopters were designed back in the early 1920s, and they didn't look like a promising capability for military or civilian use. Nevertheless, the United States Army started its helicopter program in 1921. Within two years more than 100 flights of a helicopter designed by Dr. George de Bothezat were accomplished. The prototype could hardly perform a controlled flight, was expensive, and not a desirable flying machine in any manner. In 1926 the Air Service decided to close the program.<sup>9</sup> Meanwhile in 1920-1930s interest to autogiro outshined a helicopter. In 1937 a new successful helicopter Focke-Achgelis Fa-61, designed by the Germans, demonstrated many unique capabilities never seen before, which brought attention back to helicopters. This was a machine that could overcome terrain features, did not need special installations and runways to operate

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<sup>9</sup> Carl John Horn III, "Military Innovation and the Helicopter: A Comparison of Development in the United States Army and Marine Corps, 1945-1965" (diss., The Ohio State University, 2003), 28.

and could land almost in any place bigger than its rotor diameter. It demonstrated the nature of the helicopter. Nevertheless, rotorcraft of that time had great limitations such as speed, range, lift capability, and the inability to use instrumental navigation.<sup>10</sup> Moreover, even when a helicopter performed well, it was considered to be a flying toy that attracted spectators rather than a military or even civilian use capability. It was unique and unknown yet, so it took some time to get used to it and mature state of technology as well.

### Helicopters in World War II

Soon after the introduction of a new vertical capability by the Germans, the United States Army Air Corps decided to obtain one as well. The first rotary wing machine XR-1 started its test flights in 1941. Tests were unsuccessful and the contract was cancelled after several years. Not all prototypes had such bad luck. The same year, after successful demonstration of the VS-316 by Igor Sikorsky, the Army Air Corps decided to purchase a single helicopter for further field-testing. The helicopter received his new military name XR-4. Subsequently, Sikorsky delivered thirteen modified XR-4 helicopters to the Army Air Forces. The United States Navy bought a single helicopter as well to test it as an anti-submarine capability.<sup>11</sup> A modern United States Army Aviation

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<sup>10</sup> Ibid., 29.

<sup>11</sup> Colonel Hollingsworth F. Gregory, *Anything a Horse Can Do* (New York: Reynald and Hitchcock, 1944), 76-85.

starts its life story on 6 June 1942, when the Secretary of War gave an order to create an organic air observation service for field artillery.<sup>12</sup>

In April 1944 the first YR-4 was baptized in combat. YR-4, piloted by Lieutenant Carter Harman, executed the first heliborne combat search and rescue mission. He picked up two downed pilots behind Japanese lines in Burma and returned them safely to friendly territory.<sup>13</sup>

In the beginning of 1943 the Army required another XR-6 helicopter with better characteristics as a replacement for the light liaison plane. The Director of Military Requirements approved procurement of 900 XR-6 helicopters. However, only 219 helicopters were delivered and the program was cancelled in December 1945, finishing the history of United States rotorcraft in World War II.<sup>14</sup>

During World War II there was limited use of helicopters due to technological immaturity, however, they showed a great potential for the Army and the Navy. The war brought a sense of urgency and funds for a rapid development of rotary wing machines. As a result, the United States' small helicopter industry was the most advanced in the world at that time. The majority of United States Army aviation assets during World War II were fixed wing. Besides, ground commanders realized a continuing need for organic aviation, which subsequently influenced a need for organic helicopter capability. These

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<sup>12</sup> James W. Bradin, *From Hot Air to Hellfire: The History of Army Attack Aviation* (Novato, CA: Presidio, 1994), 70.

<sup>13</sup> Howard K. Butler, *The Army Ground Forces and Helicopter, 1941-1945* (Saint Louis, MO: Historical Division, United States Army Aviation Systems Command, 1987), 2.

<sup>14</sup> Gregory, 142-144.

positive conclusions set the stage for continuing existence of Army Aviation and ability to become independent from the Air Force in 1947.<sup>15</sup> In 1946 the Bell Corporation sent the first thirteen Bell YR-13 helicopters to the Army. This company, as a contractor, opened the first Army helicopter-training course in San Marcos, Texas, in 1947, where pilots were qualified after 25 hours of flight instructions.<sup>16</sup>

### Helicopters after World War II

To understand the post World War II approach, the analysis of the Army and Marines approach will follow in next chapter to explain military innovation and in particular vertical envelopment capability during the late 1940s and the beginning of 1950s. That was a period of significant changes in the world and inside the United States as well. World War II ended and winners possessed enormous forces, which were reduced during following years because there was no need to keep such big armies during peacetime. From the other side a tremendous new weapon was invented by the United States and the Soviet Union was about to match the United States' level of expertise by creating its own samples. The world had changed. The United States Army and the Marine Corps understood a nuclear threat to the battlefield environment differently, which in combination with several other factors brought them to different perspectives of a relatively young helicopter capability.

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<sup>15</sup> James W. Williams, *A History of Army Aviation, from its Beginnings to the War on Terror* (New York: iUniverse, 2005), 423.

<sup>16</sup> Richard Tierney, *The Army Aviation Story* (Northport, AL: Colonial Press, 1963), 93-96.

It is common opinion that the Korean and Vietnam Wars were the first conflicts with a massive application of helicopters on the battlefield. Facts say that the first helicopter war was the Malayan emergency, from 1948 to 1960, where the British Army used rotary wing aircraft very effectively to fight Communists in the jungles where ground transportation was a challenge. The British were the first military to discover a beneficial use of new aerial assets for the following missions: medical evacuation, reconnaissance, transportation of troops, paratrooper drops, communications and defoliation. Lessons learned by British rotary wing aviation in the Malayan emergency were incorporated by the United States military and were the starting point for massive use of helicopters on the battlefield.<sup>17</sup>

### Conclusions

This chapter provides the reader with some background information and sets the stage for the following more detailed and focused analysis answering the primary research question, "Why did it take so long for the Army to develop its organic helicopter capability?" Secondly, the reader should understand the approach and state of helicopter technology in late 1940s. Helicopters still were immature aerial vehicles with limited capabilities. The primary vision for helicopters at that time can be described as a flying jeep providing lift for several people and limited cargo. Helicopters had already gotten their narrow mission, which had future perspectives as maturation of technology occurs.

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<sup>17</sup> Howard A. Wheeler, *Attack Helicopters: A History of Rotary-Wing Combat Aircraft* (Baltimore, MD: Nautical and Aviation Publication Co. of America, 1987), 24-25.



Helicopters were used in single to provide support missions. In the next chapter, the author will cover the Korean War period in more details about the Army and the Marine Corps' preparation for the war, where helicopters grew in numbers and capabilities.

## CHAPTER 3

### THE KOREAN WAR

#### Introduction

In this chapter the author will provide detailed information and analysis of the Army and the Marine Corps' approach to the helicopter innovation during late 1940s in preparation for the Korean War. The conflict will be covered as well to draw conclusions about both services' success in vertical capability implementation. This war gives a great example of different approaches to capability development during peacetime, which resulted in different degrees of efficiency in helicopter use in war. One can use this chapter to compare and contrast innovation during a peacetime period.

#### The Marine Corps

The Marines provided a great example of timely adaptation of a new vertical capability for their needs in a particularly short period of time after the World War II. After the first and only use of an atomic weapon by the United States in Japan in August of 1945, the world changed. Strategies had to be reevaluated against a new nuclear threat. The United States conducted a series of nuclear tests in the Bikini Atoll in 1946. These tests showed that a large-scale classical amphibious operation did not seem to be feasible anymore, because it involved Force concentrations that formed desirable targets to be destroyed by nuclear weapons.<sup>18</sup> Emerging circumstances forced the Marines to change the nature of their core amphibious operations, and there was an urgent need to find a

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<sup>18</sup> William A. Shurcliff, *Bombs at Bikini: The Official Report of Operation Crossroads* (New York: W. H. Wise, 1947), 136.

new kind of operations to move forces from ships to shore. New vertical capability seemed to be a solution. The vertical concept allowed ships to be dispersed and not endangered by a single nuclear strike. Helicopters could deliver troops and weapons ashore from different directions meeting together at the landing zone. Initially, the Marine Corps were focused only on the ship to shore transportation abilities of helicopters. Subsequently, however, Marine Corps officers recognized a greater potential of heliborne landings, especially an ability to move forces quickly farther inland and use them in the subsequent land operations.

The next vital factor that played its role in the Marine Corps' innovation success were relations with the Navy, which understood and accepted new helicopter concept and associated doctrinal changes. The reason for such a friendly approach was the Navy's own experience between World Wars. During the 1920s and 1930s, the Navy had experienced the introduction of naval aviation and submarines. Junior officers of those years became senior officers and were tolerant of innovation and changes. The Marine Corps and the Navy had an innovation-friendly institutional culture, which encouraged new methods for problem solving.<sup>19</sup> The two services managed to maintain win-win relationships that resulted in a smooth and fast incorporation of helicopters by Marines.

The Marines understood the potential of a vertical capability and developed a vision from the early years. In 1947, before the creation of a single helicopter unit, they had already printed Phib-31 – the first manual about the use of helicopters. This is an interesting fact, because the Marines managed to foresee organization, command and

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<sup>19</sup> Horn, 132-133.

tactics of helicopter employment far in advance of the condition of helicopter technology, which can be shaped to meet the needs of vertical assault. Once the state of technology was ready they could start using the concept. This concept, tactics and techniques established the doctrinal basis for vertical capability employment. The Marine Corps conducted many experiments with this new capability including air-ground communication practice before doctrine creation and continued refining it in further exercises and subsequently during the Korean War, where terrain and nature of threat provided a great chance to test helicopters in the combat.<sup>20</sup> The resulting doctrine gave Marines a direction for a future development in the exact way they wanted.

The Marines experience in the field of helicopter employment began in December 1946, when Quantico, Virginia, became a home for the first provisional helicopter squadron.<sup>21</sup> In the beginning of 1948 Marines received their first Sikorsky HO3S-1 helicopters. Several months later, possessing five aircraft, they started to participate in numerous training exercises and demonstrations including to members of the Congress and senior Department of Defense officials.<sup>22</sup> This public approach gained the support of senior military and government officials, which was a precondition for future development and budgeting. In 1949 the Marines recognized that helicopters could land a Regimental Combat Team in less time than the conventional landing of four assault

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<sup>20</sup> Ibid., 114-115.

<sup>21</sup> Eugene W. Rawlins, *Marines and Helicopters, 1946-1962* (Washington, DC: History and Museum Division Headquarters, U.S. Marine Corps, 1976), 105.

<sup>22</sup> Ibid., 26-27.

platoons.<sup>23</sup> A provisional helicopter squadron refined a vertical envelopment doctrine by conducting various experiments particularly with arming helicopters for close air support. They performed different tasks with various platforms and weapon systems, including recoilless rifles, rocket launchers, a 3 inch Davis Gun and Energa grenade. They wanted to create a tank-killer, nevertheless the helicopter showed a limited effectiveness as an anti-armored platform at that time.<sup>24</sup>

The Marines were prepared for the Korean War in regards to helicopter employment. They managed to develop a doctrine, techniques and procedures and obtain enough helicopters prior to war. They conducted many exercises and got enough experience to hit the ground running from the early days of the conflict. Marines were ready and eager to use helicopters not just as a logistical tool, but also as a transport vehicles in combat zone, which started a new era for helicopters. A need for a new troop mobility tool was urgent, due to the nature of warfare, the highly restrictive terrain in Korea, and a very limited infrastructure. Poor road network and conditions prevented effective ground mobility and made force movements predictable and vulnerable to enemy ambushes. Based on the assessment helicopters looked like a desirable solution and provided the Marines with a great degree of tactical mobility.

In the beginning of the war Marines conducted small-scale helicopter operations such as reconnaissance, liaison, laying wires, rescuing of downed pilots and casualty

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<sup>23</sup> Horn, 66.

<sup>24</sup> Ibid., 75.

evacuation operations.<sup>25</sup> The Marines had a shortage of helicopters in the theater, which prevented large-scale operations until August 1951, when the first Marines squadron, HMR-161, arrived in Korea equipped with bigger and more capable Sikorsky HRS-1. That same year, the helicopter squadron moved an entire battalion from its reserve area to a new position. They used 12 helicopters to lift 958 combat equipped marines in six hours.<sup>26</sup>

Regardless of the large-scale combat operations, helicopters gained its public reputation because of life saving medical evacuation missions. During the war they recovered 9815 seriously wounded personnel. They brought the support of society, military, and national leadership.<sup>27</sup> The Marine Corps' helicopter units transported 60,046 men and 7.5 million pounds of cargo during the three years of conflict. All this experience in combat validated their correct doctrinal approach and the concept of vertical assault. The helicopter found its place in modern combat and there were no more doubts about further use and ability of helicopter to survive on the battlefield.

To sum up a great example of Marines innovation with vertical assault in the late 1940s and beginning of the 1950s, I will highlight following factors which brought them to the point. First of all, the Marines were stimulated by the changing nature of threat. Secondly, the Marine Corps had developed good working relations with Navy and both

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<sup>25</sup> Peter B. Mersky, *U.S. Marine Corps Aviation: 1912 to the Present* (Mount Pleasant, SC: Nautical and Aviation Publishing, 1997), 131.

<sup>26</sup> Geoffrey Parker, *The Cambridge Illustrated History of Warfare* (New York: Cambridge University Press, 1995), 4-6.

<sup>27</sup> Horn, 99.

services were innovation friendly. Thirdly, they showed their achievements to the public getting support of senior military leadership and Congress. Lastly, the state of technological progress was enough to conduct initial experiments and subsequent large-scale combat operations.

The Marines' innovation with vertical assault was timely, adequate and creative. The biggest step in this innovation was the creation of transport helicopter squadrons. Almost no big organizational changes were made after that.

### The Army

After a good example of the Marines' approach to helicopters employment, the Army approach provides a clear view of a different service's attitude towards helicopter innovation at the same period. Comparison will provide a closer look and better understanding. The end of World War II brought a numeric and budget reduction in the Army and reprioritization of resources. Helicopter capability was not among the top priorities and suffered from a lack of budgeting and misunderstanding of its future potential.

The Army as an organization did not welcome rapid innovation and changes. A great example of Army's conservative approach was a slow transition from animal (traditional, well-known capability) to mechanized mobility (new, immature, not reliable enough in early years). It was difficult to create a vision especially for immature technology. A conservative spirit postponed innovation and initial implementation of a new technology. American tactical units used to have the same World War II doctrine in

the beginning of the Korean War.<sup>28</sup> During World War II, the Army managed to have quite an effective approach to new helicopter capability, developing and testing new flying machines. Nevertheless, when the war was over, even monitoring the Marines' success in experiments with rotorcraft, the Army failed to run its own tests and increase experience and understanding.

Another point that needs to be stressed to understand the Army approach is a different understanding of nuclear threat. A concept of strategically mobile forces, who will be used to seize enemy's nuclear sites had the biggest impact on helicopters' destiny. The Army focused on paratroop operations and saw parachutes as a ground troop mobility means.<sup>29</sup> Meanwhile the Army decreased the number of its divisions from more than 89 to 10 during post-war demobilization. Nevertheless, they decided to keep two airborne divisions at full strength.<sup>30</sup> In the late 1940s they even decided to reduce a weight of airborne division by three and vehicles down to half to make it easier to transport and airdrop, which had a tremendous effect on organic tactical mobility. That meant that, once dropped, airborne forces were short on organic vehicles, which reduced their effectiveness. At that time helicopters could be a solution for this lack of organic tactical mobility. However, in 1946 the War Department Board on Army Equipment

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<sup>28</sup> Ibid., 79.

<sup>29</sup> John R. Galvin, *Air Assault: The Development of Airmobile Warfare* (Portland, OR: Hawthorn Books, 1969), 95.

<sup>30</sup> Horn, 95.



stressed the helicopter's limited capabilities as suitable only for resupplying of airborne troops.<sup>31</sup>

Another stumbling block for helicopter development was the difficult win-lose relationship between Army and Air Force. When World War II was over, the Army Air Force faced a 75 percent budget reduction in aircraft equipment. With little money left, the aviators were focused on development of jet fighters and strategic bombers. The Air Force was not interested in support of force's tactical movement and they did not feel a real value in helicopters overall. In 1947, the Air Force became an independent branch and the Army retained control only of its organic aircraft. Nevertheless, to eliminate duplication of efforts and save money the Air Force retained authority for development and procurement of all aircraft.<sup>32</sup> The Air Forces claimed to be the only service providing airlift to the Army. That is why they did not accept a heavy helicopter program and only small helicopters were tested.<sup>33</sup>

To make things worse, there were numerous misinterpretations of the National Security Act of 1947, because it was ambiguously worded. That gave a great deal of deviation for both services. The Air Forces could make a selective procurement of aircraft and stay focused on medivac and air assault vehicles regardless authorization for development of heavier helicopters.<sup>34</sup> In 1949, the two services conducted several

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<sup>31</sup> Ibid., 89.

<sup>32</sup> Ibid., 90.

<sup>33</sup> Ibid., 122.

<sup>34</sup> Ibid., 20.

negotiations that resulted in Joint Army-Air Force Regulation 5-10-1. It contained missions for organic army aircraft and a 4,000 pound weight limitation on helicopters. The same year prior to the Korean War, the Army increased its interest in helicopters. Army Field Forces Board No.1 expressed a need for six types of helicopters.<sup>35</sup> During the Korean War there was a certain normalization of relations between the services after signing of two agreements between Secretary of the Army Frank Pace and Secretary of the Air Force Thomas K. Finletter. These agreements resulted in the removal of all helicopter weight limitations and changing of rotorcraft classification according to functions and not by size. They set primary Army aviation functions of ground troop support: command and control, transportation, and medical evacuation.<sup>36</sup>

Conflicting relations between services, lack of support inside the Army, and the immature state of helicopter technology prevented the Army and Air Force leadership from developing a deep understanding and vision for future perspectives of vertical capability use. This approach resulted in the lack of budgeting and limited experiments with the 82nd Airborne Division during interwar period.

When North Korea invaded South Korea in June 1950, the Army possessed only 56 utility/observation helicopters, none of which were in the Far East.<sup>37</sup> I have already mentioned that terrain differed a lot from the European one well known to mechanized troops during the previous war. In this rough terrain the helicopter seemed to be a partial

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<sup>35</sup> Report of the Army Field Forces Board No. 1, dated 17 November 1949.

<sup>36</sup> Horn, 125.

<sup>37</sup> Edgar F. Raines Jr., "Organic Tactical Air Transport, 1952-1965," *Military Review* (January/February 2000): 84.

mobility solution. Even without a special helicopter doctrine or a great deal of peacetime experience, troops recognized a great value of new tactical air vehicle. Helicopters started accomplishing many missions: air transportation, medical evacuation, wire laying, reconnaissance, artillery spotting, messenger service and many others. In case of both the Army and the Marines medical evacuation missions brought public support of forces on the battlefield. Helicopters in the Army for this mission were organized into four detachments, which became one of the first formal Army Aviation helicopter organizations.<sup>38</sup>

In 1951, after observing the Marines' inspiring example of helicopter use, General Matthew B. Ridgeway made a recommendation that the Army needed to have at least four helicopter battalions for troop support. It took surprisingly long for the Army during the war to have the first helicopter company in Korea. In 1952 the U.S. Army started development of the airmobile concept – tactical movement of troops by a helicopter. The Army decided to form 12 helicopter battalions as soon as the technological state of helicopters will meet troop-carrying requirements. Nevertheless, by the end of war, the Army had fewer than 200 helicopters in the theater.<sup>39</sup>

Until the end of war, the Army did not have a lot of experience with helicopters as a combat transport, because the first units reached a theater late. At that time combat was quite static and the Army missed the opportunity to practice during offensive operations. Conflicts with the Air Force, lack of vision and unwillingness and ignorance of

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<sup>38</sup> Major David Law, “United States Army Aviation Organizational Changes” (Monograph, School of Advanced Military Studies, 2012), 17.

<sup>39</sup> Horn, 117.

leadership to incorporate lessons learned by Marines played its negative role as well. That resulted in future slow and late creation of doctrine, tactics and techniques.<sup>40</sup> At the end of the war, the Army possessed 800 helicopters (84 cargo) and fewer than 200 were used in Korea.<sup>41</sup>

Misunderstanding of capabilities and leadership's unwillingness to take a proactive approach prevented the Army from early development and incorporation of vertical capability. The Army entered the Korean War without possessing a working model of helicopter application, because it failed to innovate during the peacetime period. Army Aviation had only a working paper on helicopter application, but no doctrine or field manual until 1957. The Army did not have a central agency with authority to develop, procure and implement helicopters. It resulted in the lack of vision and direction. That is why the Army did not manage to transport units under battle conditions during war. Helicopters were still looked at as aerial trucks instead of new combat machines. Overall, limited production capacity prevented the Army from obtaining of helicopters from one side and no doctrine prevented the effective use of rotorcraft from another side.

### Conclusions

After analyzing the two services' approach in late 1940s and beginning of 1950s one can make obvious conclusions about their approach and lessons learned during this

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<sup>40</sup> Ibid., 127.

<sup>41</sup> John W. Kitchens, "Cargo Helicopters in the Korean Conflict," *U.S. Army Aviation Digest* (November-December 1992): 38.

period. First of all, to innovate effectively with vertical envelopment there should be a certain state of technology sufficient for mission accomplishment. Secondly, a clear vision of national and service leadership is a precondition for development and budgeting of any innovation. Thirdly, different understanding and goals with sister services, who have a great influence, could be challenging and prevent development. Lastly, if one wants to use capability advantageously during the war, he needs to develop it and conduct sufficient practical exercises as a preparation during peacetime. Countries fight wars with capabilities they have at hand, not those being tentatively developed.

## CHAPTER 4

### INTERWAR PERIOD

#### Introduction

This chapter will cover a 7-year period from the end of the Korean War in 1953 until 1960 when the U.S. started its involvement in Vietnam. This was the period of Dwight D. Eisenhower's presidency (1953-1961). This specific interwar period selection was logical to have a look at the Army and the Marines' approach in the helicopter application during peacetime. One can argue that there had already been U.S. involvement in Vietnam since 1954. However, it had been only a military assistance along with providing weapons and advisors. The U.S. presence was very limited and there were no helicopter units in the theater at that time. These years were actual peacetime for the U.S., but an awareness of possible future involvement definitely influenced minds and gave a sense of necessity for troops training and equipping. On the other hand, the war in Korea was over and both services had gained unique experience with a new vertical capability.

#### Marines

After being champions in the adaptation of vertical capability before and during the Korean War, reductions in forces and budget caused to the Marines slow their efforts after the end of the conflict. The dream of developing all-helicopter assault never came true, because during the 1950s the state of technology did not allow implementation of all desired tactics and airlifts. Moreover, the lack of a reliable medium-lift helicopter forced the Marines to make several organizational and tactical changes to their approach as they

became lighter and even more mobile forces. The Marine Corps always relied on the state of technology and matched their efforts with the most advanced level. That is why they welcomed the introduction of the turbine-powered helicopter in the second half of 1950s and the vertical envelopment concept became even more effective.<sup>42</sup>

After the end of the Korean War the Marines continued development of the vertical assault doctrine. They focused their efforts on acquisition of new helicopters and continuous amphibious exercises. The Marines prepared their leaders for future large-scale helicopter assaults.<sup>43</sup> In 1953, the Commandant of the Marine Corps formed the first Advanced Research Group, who were focused on refining future amphibious operations and determining resources needed.<sup>44</sup> In the final paper, they constructed a concept of helicopter mobility in combination with tactical nuclear weapons, where vertical capability allowed them to exploit initial shock, seize key terrain and increase the area controlled by troops.<sup>45</sup> One must understand that helicopters were only a part of solution for a new assault in the era of atomic weapons. To make the concept all-helicopter the Marines had to possess not less than sixteen helicopter carriers and enough medium helicopters, which were not developed at the moment and did not seem likely to be in the future as well. So, this concept was completely disconnected with reality and current and expected in nearest future state of technology. Nevertheless, many resupply

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<sup>42</sup> Horn, 167-168.

<sup>43</sup> Ibid., 136.

<sup>44</sup> Mersky, 192-193.

<sup>45</sup> Horn, 142-143.

problems, such as maintenance and security of ground supply infrastructure that usually was easy to disrupt, seemed to be avoided by using cargo helicopters. That looked like a huge increase of efficiency in supply operations, economy of forces and logistics during both atomic and non-atomic warfare.<sup>46</sup>

The Eisenhower Administration's New Look had to be incorporated into doctrine. Since the Marines' first doctrinal publication they published another, *Landing Force Bulletin 2 Interim Doctrine for Tactical Warfare and Helicopter Operations*. These doctrinal publications translated theory into practice. In addition, in 1953-1954 the Marine Corps did not have the capabilities for the all-helicopter assault and the Advanced Research Group provided insights on nine helicopter squadrons that needed to be equipped with 180 larger transport helicopters to meet assault requirements. This vision was approved by the Chief of Naval Operations in December 1955. Shortly after approval, the Marine Corps School incorporated this vision into the publication of the *Landing Force Bulletin 17*, which introduced vertical envelopment and the future need to lift an entire division.<sup>47</sup> The Marines continued their smart approach of putting words on paper and making them a doctrinal publication, which gave an official way of development and vision for all leaders forcing them to play at the same sheet of music. Sometimes technology had not developed sufficiently, nevertheless, the doctrine created mindsets prepared to integrate new equipment as soon as it arrives. Regardless of the vision and need for nine heavy-lift helicopter squadrons capable of lifting 155 mm

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<sup>46</sup> Ibid., 140-141.

<sup>47</sup> Rawlins, 66.



howitzers and 2.5 ton trucks, the Navy rejected the proposal, because of its very high price. Ultimately, only 34 heavy-lift helicopters were procured along with 140 medium-lift. Helicopters, which were cheaper, but much less capable. This resulted in an inability to incorporate an all-helicopter assault. Marines had to modify their techniques and doctrine to meet current a state of capabilities available.

The Marines conducted another study in 1956 examining the employment of helicopters through 1960 and concluded that helicopters need to be distributed to divisions in such a way that each of the divisions is able of lifting simultaneously two companies and command group up to a distance of 25 miles.<sup>48</sup> Furthermore, there was a 25,000 man force reduction from 1957 to 1959 and 30 percent reduction in aircraft. Inadequate funding and competition with fix-wing aviation on the funds gave many obstacles to prevent helicopter assault development. To make things worse, new medium helicopters still had many technical problems and that prevented the Marines from procurement as well. The Marines refocused on light helicopter squadrons instead of medium, which would give them more flexibility during operations because of the much bigger number of helicopters available. Surprisingly, in 1962 the Marine Corps would exceed its own expectations operating 409 helicopters instead of 337 planned.<sup>49</sup> At that time, there were only 31 medium transport helicopters available.<sup>50</sup> With such a large number of helicopters, the Marine Corps was ready to face new challenges, which will

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<sup>48</sup> Ibid., 71.

<sup>49</sup> Mersky, 203.

<sup>50</sup> Rawlins, 81.

continue to appear during following decade in a very controversial way during the war in Vietnam.

The Marines had big plans for helicopters after the Korean War. Nevertheless, obvious and objective reasons such as immature state of technology, high procurement prices for helicopters, need for a large number of helicopter carriers to meet new assault concept, prevented vertical capability from preplanned development. Comparing with the late 1940s and the beginning of the 1950s the Marine Corps was less progressive in helicopter innovation. However, they were very flexible and adapted different capabilities for their specific needs, modifying doctrine. They were still progressing, but at a relatively slower speed.

### The Army

After the Korean War, despite having a former Army general as a president, the Army faced the lowest priority in the new warfare concept in the threat environment of that days. The Soviet Union matched the U.S. efforts in nuclear program and since 1953 was a peer to the U.S. nuclear capabilities. The nuclear assumption changed forces priority. The Army got the lowest one. Huge priority was given to the Air Force with allocation of sufficient budget; the Navy had its unique role as well. The competition for money was tough. And it would continue to be so in the 1960s when a promising new toy, intercontinental ballistic missiles, arrived to the forces. The most expensive piece of the armed forces is personnel, and that is why budget savings came from reduction of Army structure. Since 1954 to 1961, the Army personnel decreased from 1.5 million

soldiers and budget of \$16.2 billion to 859,000 men and budget of \$9.6 billion.<sup>51</sup> In the new nuclear age, the helicopter received its role as a tactical mobility tool to seize ground rapidly after nuclear strikes, however, rotorcraft had never been a number one priority and had to fight hard to survive and develop in the Army. Thus, the Korean War brought increase of defense spending, however the Army did not get its equal increase of the budget.

Possessing a great deal of experience after the Korean War, General Matthew B. Ridgeway, the Army Chief of Staff, was one of the true believers of necessity of American soldier on the ground. He proposed improvement of Army capabilities by providing them strategic and tactical air mobility on the nuclear battlefield. The general had seen the future of the Army accomplishing a majority of tasks through the air.<sup>52</sup> The battlefield had changed and the Army needed to adapt to it. That is why the Army needed three types of airlift. The Army believed that two of three types, battlefield air logistics and tactical airborne, would be accomplished by its organic aviation. The only long-distance strategic deployment of forces was foreseen as the Air Force duty thus creating another conflict of interest between sister services. The Air Force had their own strategic bombers and jet fighter priorities and were not eager *to play tactical games* helping the Army. Moreover, the Air Force was unwilling to develop helicopters and viewed each

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<sup>51</sup> Andrew J. Bacevich, *The Pentomic Era* (Washington, DC: National Defense University Press, 1986), 16-20.

<sup>52</sup> Matthew B. Ridgeway, "An Army on its Toes," *The Army Combat Forces Journal* (December 1954): 10.

attempt to increase organic Army Aviation capabilities as an attempt to usurp Air Force functions.<sup>53</sup>

From the other side the Army had not been prepared for the Korean War and had a very limited helicopter experience in the combat. That resulted in an absence of future vision and precise models of how to use rotorcrafts. There were even doubts about using the helicopter in combat at all. To make things worse, they made no progress in developing of the doctrine. The Transportation Corps were the only organization who felt great benefits after the Korean War from using helicopter, a new logistical tool. The helicopter modernized logistical support, provided a new means of supplies distribution and was seen as an aerial truck with less attention and funding then a truly air combat vehicle.<sup>54</sup> All these examples showed a real problem of the Army Aviation – absence of its own branch. Army Aviation was as orphan. It was very hard to prove its needs and it relied heavily upon everybody else on budgeting, development and procurement of aircrafts. There was no vision for the Army aviation and it was hard to defend its interests. After the Korean War General Ridgeway recommended creation of the Army aviation plan, which would guide forthcoming progress. According to that five year plan the Army should possess around 8500 aircraft by 1959. Another vital recommendation was the creation of the Army aviation branch within the Army G-3 staff and creation of the Army aviation center.<sup>55</sup>

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<sup>53</sup> Christopher C. S. Cheng, *Air Mobility: The Development of a Doctrine* (Westport, CT: Praeger, 1994), 76.

<sup>54</sup> Horn, 180-181.

<sup>55</sup> Ibid., 180.

The Army aviation's destiny relied heavily on individuals, who were zealots of helicopters and were fighting there valuable existence in the Army. Lieutenant General James M. Gavin was one of these leaders who believed in the helicopter and could envision its potential. In his famous article "Cavalry. And I Don't Mean Horses" he claimed that by combining armor and cavalry into one branch in 1950 the Army had literally killed the cavalry, which had served the nation well over the years. He stressed the necessity of cavalry units to regain mobility. After analysis of Normandy's airborne operation in 1944, Gavin described the ability of paratroopers to seize key terrain, however, they lost their mobility once on the ground. Gavin provided recommendations that sky cavalry could provide a combination of strategic airborne mobility with tactical mobility of rotorcraft. He envisioned a great potential of helicopters as tools to regain troop mobility performing traditional roles of cavalry units: reconnaissance, flank security, pursuit, and exploitation.<sup>56</sup>

Army aviation experienced a huge progress with the creation of the Director of Army Aviation as a part of the Department of the Army's office of the Deputy Chief of Staff, Operations in 1955. Brigadier General Hamilton H. Howze took charge of the office. He came from the Army family and was credible to combat arms leaders. He had a clear vision; although he did not have pilot wings, he mastered new aerial activity quickly. He had all the qualities of a good leader to show the value of the Army organic aviation and educate leaders of various levels about benefits of helicopters for the ground troops. He provided the basis for the future development of vertical capability for the

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<sup>56</sup> James M. Gavin, "Cavalry and I Don't Mean Horses," *Harper's Magazine*, April 1954, 54-56.

Army. To gain leadership support he established the Eagle Eye program to provide the helicopter experience for the top-level management. They picked up prospective top-level leaders carefully and trained them to fly. This program resulted in better understanding and acceptance of helicopters. That was a quick way to sell the idea to the top management.<sup>57</sup> An additional big step for Army aviation was publishing of Training Circular 1-7, Employment of Army Transport Aviation, in 1955 and its modified version in 1956. In this document, the combat support function and tactical mobility role became the primary functions of the Army aviation.

The fight between the Army and the Air Force for resources and independence for the Army aviation continued for long years. There was relative progress in resolving the issue between two services in the second half of the 1950s. Secretary of Defense Charles Wilson issued a series of directives setting 100 miles forward of and to the rear of the line of contact as a limit for the Army to support ground operation by its organic aviation. He increased the weight limitation for the helicopters up to 20,000 pounds.<sup>58</sup> Nevertheless, the Army had not yet obtained its ability for research and development to close a gap between its light aircraft and the Air Force's large vehicles. The Army unique tactic air mobility and support area was of no interest to other services, however, it was still dependent on the Air Force for research and development.<sup>59</sup> Brigadier General Hamilton H. Howze continued Wilson's approach and proved in his article the necessity of the

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<sup>57</sup> Horn, 210-213.

<sup>58</sup> Ibid., 190.

<sup>59</sup> Maxwell D. Taylor, *The Uncertain Trumpet* (New York, NY: Harper and Brothers, 1960), 168-169.

Army aviation for the future ground operations.<sup>60</sup> This attitude allowed future growth and development of helicopters capable to operate within the 200 miles zone. Helicopters now could conduct air assault behind the enemy lines and provide airlift to improve local mobility.<sup>61</sup> Army aviation became much more independent and was on its way to become self-determining. Another example of a slow Army innovation approach was a three-year gap between the first draft and final publishing of the Army aviation field manual in June 1958.

In the second half of the 1950s, the threat of tactical nuclear weapons use on the battlefield brought a new look to structure, doctrine and equipment that can be effective in the new type of warfare. To bring balance to the battlefield, the Army reorganized into the Pentomic divisions bringing dispersion, mobility and flexibility to the forces. This innovation was along the lines of air mobility and air cavalry concepts and was very promising to helicopters at that time, because they were unique vehicles able to operate in a wide front far into nuclear contaminated areas. These divisions were of three types: armored, infantry and airborne. The concept required increase of helicopter's numbers, but in reality there were not enough aircrafts in the structure for replacement of ground vehicles to make division mobile enough to face new battlefield conditions. Much desirable equipment had never arrived. For example, infantry and armored Pentomic divisions had only one company of 49 aircraft with only six light transport helicopters,

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<sup>60</sup> Major General Hamilton H. Howze, "Future Direction of Army Aviation," *Army* 7 (December 1956): 5.

<sup>61</sup> Horn, 192.

which were able to lift only one platoon.<sup>62</sup> A sky cavalry troop was playing the same role of target acquisition for the artillery, which aviation was doing in their early years in the Army. Helicopter zealots had many expectations with Pentomic divisions, but great plans on paper had almost no progress in real life with insufficient numbers of aircraft for missions assigned. Many Army studies showed that divisions needed at least 20 transport helicopters each.<sup>63</sup> There were several reasons for such a problematic equipment supply. The immature state of technology, small production capacity of the national helicopter industry, plus high procurement prices and operating costs were among the problems, which prevented success of helicopters implementation in Pentomic divisions. A larger helicopter was another stumbling block for development and the helicopter industry was barely successful with this project in 1950s. Smaller utility helicopters were much more encouraging in development, especially with invention of gas-turbine powered helicopter, that had following advantages: increased lift factor, self-sealing fuel tanks, smaller size of engine became less vulnerable to air defense fire and allowed more space in the fuselage, simpler and cheaper maintenance, higher operational readiness. That is why turbine engine helicopters became the turning point in helicopter history. One of the Army aviation turbine working horses, the UH-1 Iroquois, came into Army service in 1959.<sup>64</sup>

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<sup>62</sup> U.S. Department of the Army, U.S. Army Infantry School, *Infantry Reference Data* (Fort Bedding, GA: U.S. Army Infantry School, 1961), 67-68.

<sup>63</sup> Army Armor School, *Army Aviation Handbook* (Fort Knox, KY: Army Armor School, August 1959), 4.

<sup>64</sup> Horn, 200-205, 210.



This innovation forced leaders to think about modification of paratroopers into more tactically mobile units.

It was logical to convert airborne units into airmobile, because once on the ground soldiers had almost no mobility means and fire support. They were still relying heavily on aircraft to support them with fire and move them. The great advantage of helicopters was flexibility to operate from unprepared sites. They could hide from enemy radars using terrain contour flying across tree-top level which made them hard targets for small arms as well. The only major disadvantage was a limited tactical radius and they could not provide strategic and even operational mobility.<sup>65</sup> Thus, their field of occupation was obvious – tactical mobility and ground troops support vehicle. Operations from ships were not the only option for helicopters as a strategic tool.

A new “sky cavalry” concept promised to replace original cavalry functions with helicopters and to facilitate the most rapid maneuver ever seen on the battlefield. Initially, helicopter units operated according to horse cavalry doctrine of 1936.<sup>66</sup> Moreover, there was an urgent need to develop this technology to breach the capabilities gap. It led to initial experiments with sky cavalry unit formed in 1955 by the 82d Airborne Division. By mid-1957, an Aerial Combat Reconnaissance platoon was created to demonstrate capabilities. Subsequently it became a nucleus for a company, which Table of Distribution was approved in 1958.<sup>67</sup> The concept was tested in 1955 during Exercise

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<sup>65</sup> Ibid., 224-226.

<sup>66</sup> Frederic A. Bergerson, *The Army Gets an Air Force* (Baltimore, MD: The Johns Hopkins University Press, 1980), 74-75.

<sup>67</sup> Tolson, 6-7.

Sage Brush, involving 140,000 troops testing the new strategy of tactical nuclear weapons use.<sup>68</sup> The sky cavalry concept had some organizational and training problems before and during exercise and the unit did not manage to prove its validity. Poor performance of vertical capabilities during the exercise prevented them from been incorporated into the Pentomic Division's structure as a sky cavalry troop; instead, helicopters were represented only as a target acquisition section. Nevertheless, the force managers recognized that vertical capability was desirable on the nuclear battlefield to cover greater distances and a sky cavalry company was created in the Armor School. This company did not perform well during following exercise as well.<sup>69</sup> Only the Aviation School concept of sky cavalry was more or less productive. Without funding and external support, the school conducted initial tests with armed helicopters and renamed sky cavalry as Aerial Combat Reconnaissance. Nevertheless, integration of the Army aviation into classic ground units was challenging that prevented them from sufficient training and practice to get enough experience with aerial vehicles. Without general plan decentralized execution of helicopters tests looked like and probably was developing as a self-organization.<sup>70</sup>

Surprisingly, recognition came from an unexpected direction. The 1st U.S. Missile Command accepted benefits from helicopter support for their operations and supported the helicopter concept that was beneficial to them and the Army aviation as

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<sup>68</sup> Horn, 227.

<sup>69</sup> Ibid., 230-231.

<sup>70</sup> Ibid., 250.

well. Helicopters were used widely at the European theater for detailed tactical reconnaissance and nuclear target location. To support training in Europe, the Army published a training circular in 1959 that emphasized integration of airmobile operations into the ground operations and unit training. The last one was difficult to achieve especially at division and lower levels due to the fact that ground commanders put a low priority on the airmobility.<sup>71</sup>

From the technical point of view, after 1956 the Army started to receive enough helicopters to provide large force movement. Organizationally, vertical assets were dispersed among Pentomic divisions, allowing each one to lift only one infantry company at a time, which was far below expectations for new type of mobility on the battlefield. Divisions did not practice lifting a battle group, because they did not have the five to seven helicopter companies necessary to accomplish it. This lack of experiments prevented recognition of the helicopter's combat role.<sup>72</sup>

Moreover, technology was not a problem that prevented development. Helicopters could have developed better and more quickly if they were on the top priority list. During the 1950s, the military was doing experiments with a great variety of new concepts giving priority and relying heavily on nuclear weapons. There were many transformations ongoing in the Army, such as incorporation of nuclear tactics and creation of Pentomic divisions to support it. There were several factors that contributed to the slow development of the airmobility concept, including lack of mission and narrow vision for

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<sup>71</sup> Ibid., 240-242.

<sup>72</sup> Ibid., 243.

helicopters from the Army point of view.<sup>73</sup> One can claim that the Army changed its innovation-unfriendly approach during 1950s. This statement has a certain logic. Nevertheless, there was no acceptance of the helicopter within the Army and no mission allocation. There was no senior leadership support as well.

During the interwar years the Army experienced certain progress towards organic airmobility. First of all, it established a bureaucratic organization at the Department of the Army. That provided the basis for organization, doctrinal changes, education and popularization and experiments to gain experience by pilots. Army aviation leadership was adequate, innovative and willing to defend organic aviation interests. Secondly, the Army partially obtained control in the procurement its own aircrafts, logistical support of Army aviation and training of pilots. Thirdly, regardless of a variety of problems there was a capabilities increase in the service. Despite the positive aspects vertical capability experienced in the Army, there were plenty of negative issues, that could have been changed if the Army had a different vision and perspective for the helicopter inside organization. Next, there was no priority for helicopters in the Army after the Korean War, which resulted in the absence of a master plan. As a consequence, there was insufficient resources allocated to make things happen. Lastly, the human factor played a positive role at the highest Army aviation level, however there was an extreme lack of support from more senior levels. The new Pentomic Division had very limited airmobility capabilities, but they did not care and felt comfortable, because priorities lied in a different surface than helicopters.

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<sup>73</sup> Ibid., 244.

### Conclusions

Comparing the two services during the interwar period, the Marine Corps did not show any brilliance in its vertical capabilities development, nevertheless, the corps was solid in the priorities stressing on helicopters. They had a clear vision for the capability. Having total reliance on Navy to provide aircraft, the Marines made constant progress in new concept incorporation. These seven years of Eisenhower's presidency showed even greater necessity to have general plan, vision, and controlling organization for beneficial development of a particular capability. The Army made an advance in helicopter capabilities during this period as well. However, comparing with the Marine Corps the Army still was far behind in the development of organization and airmobile doctrine. Lack of priority for helicopters in the Army was the major reason for their slow progress.

## CHAPTER 5

### THE VIETNAM WAR

#### Introduction

This chapter provides detailed information and analysis of the Army approach to helicopter innovation during the Vietnam War period. To some extent the Army during the early 1960s had the same organizational progress that the Marines did in the late 1940s. That is why there will be no comparison with the Marine Corps in this period. The chapter starts in 1960, when the U.S. involvement in the coming conflict was obvious, although there was only a limited number of military advisors. Massive deployment of troops would occur later in the same decade. From the other side a threat of the Cold War conflict in Europe led to creation of two major new types of units: the airmobile division and the air cavalry combat brigade.<sup>74</sup> In the second half of the 1960s, the requirements of the Vietnam War drove the evolution of the air mobility concept. The essence of the chapter is massive helicopter involvement in this war, when numbers of rotorcraft and types of operations indicated a culmination of vertical capability employment. This 13-year period was still difficult, especially in the beginning. This period also shows the rapid development and production of new helicopters.

In 1961, the Kennedy administration brought a new understanding of defense policy. They wanted to make national defense policy more flexible. To balance conventional and nuclear tools the new “flexible response” appeared to provide a variety

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<sup>74</sup> John Everett-Heath, *Helicopters in Combat: The First Fifty Years* (London: Arms and Armor, 1992), 158.

of military options over the full spectrum of conflict. Thus the Army needed to be able to fight both conventional and nuclear wars. To make it more capable the Army gained two divisions for a total of 16, all of which were reorganized to fight conventional wars.<sup>75</sup>

The major change from the Army aviation side was an increase of aviation assets in the divisional structure. The Pentomic division had only an aviation company, while the reorganized division possessed an aviation battalion. A corps was authorized additional assets including three airmobile and one aviation corps companies. The Army alone had 6001 aircraft in 1963.<sup>76</sup> However, the overall aviation assets buildup looked much better than it was in reality. Dispersion of aviation throughout divisions prevented any decisive operation, where the concentration of helicopters was required. On the one hand, decentralization of aviation assets was desirable to allow cooperation and beneficial use on the lowest levels. From another hand, dispersal of aviation brought at hoc standards and procedures, which would be overcome with the creation of centralized organization, an aviation brigade, and air assault division.

In 1961, the Department of Defense decided to conduct a study to shift the balance between nuclear and nonnuclear warfare. It resulted in abandoning the Pentomic organization, which relied heavily on the use of tactical nuclear weapons. The study had a primary purpose to develop a well-balanced infantry, mechanized and armored organization for the period 1961-1965 and was named as Reorganization Objective Army Division. The age of Pentomic organization ended the same 1961 year. The concept of

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<sup>75</sup> Horn, 252-253.

<sup>76</sup> Cheng, 174.

the new division emphasized on the high degree of flexibility and the number of aircraft in divisions doubled. Aviation assets became organized into the aviation battalions.<sup>77</sup>

On 15 January 1960 Army Chief of Staff General Lyman L. Lemnitzer decided to have a board of officers to define future aviation development. The 1960 Rogers Board and 1962 Howze Board became the major Army efforts to develop airmobility in 1960s.

### The Rogers and Howze Boards

The first board was chaired by Lieutenant General Gordon B. Rogers and had a primary purpose to review requirements through 1970, develop a procurement program, and provide recommendations for fiscal year 1961. The board examined options available to the Army to improve battlefield surveillance and tactical transportation. A light observation aircraft for 1960-1970 was another area of interest for the board. The aviation industry was interested in these programs and provided design proposals with a wide range of options from autogiros to fixed-wing vertical take-off and landing aircraft. The board reviewed proposals and provided specific requirements for each type of aircraft. The board concluded with focusing on rotary wing aircraft development and stressed the perspective turbine engine UH-1 (Huey) utility helicopter as the desired for procurement. Another conclusion depicted a need to develop air to surface weapons, which could be mounted on helicopters.<sup>78</sup>

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<sup>77</sup> Richard P. Weinert Jr., *A History of Army Aviation –1950-1962* (Fort Monroe, VA: Office of the Command Historian United States Training and Doctrine Command, 1991), 145-147.

<sup>78</sup> Horn, 254-256.



The Rogers Board became the basis for material development of Army aviation and stressed on potential use of aircraft as a tactical mobility transport. In two years the Army Tactical Mobility Requirements Board was set chaired by General Hamilton W. Howze. The board was working according to following instructions: “The board . . . will conduct an extensive program of analyses, exercises, and field tests to evaluate the new concepts of battlefield mobility in terms of cost-effectiveness and transport-effectiveness factors . . . will determine the extent to which air vehicles, operating in the environment of the ground soldier, can be substituted for conventional military surface systems, both tactically and logistically.”<sup>79</sup> The most critical feature of the board was a focus on the airmobile methodology. They focused on the equipment necessary for testing of the new concepts. Moreover, the board produced a document, which subsequently became the basis for airmobility doctrine development.<sup>80</sup>

The Howze Board did not create a new concept, but provided details and explained how to develop existing ones. The board understood the concept of air cavalry as a replacement of original cavalry accomplishing its traditional missions. On 1 September 1962, the Howze Board provided its recommendations to the Secretary of Defense. The board members proposed that the Army create an air assault division, an air transport brigade, and an air cavalry brigade. It took several months to analyze Howze Board’s findings and finally the Secretary of Defense authorized the creation of the 11th Air Assault Division and the 10th Air Transport Brigade to test the board’s conclusions.

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<sup>79</sup> Horn, 258.

<sup>80</sup> Ibid.

The 11th Air Assault Division and  
The 10th Air Transport Brigade

The Howze Board gave birth to the 11th Air Assault Division on February 1963 at Fort Benning. This division was created from the scratch as a non-deployable unit to test airmobility concept. Division has a standard infantry structure combining three brigades.<sup>81</sup> The same story had happened many times before, when units had not reached there programmed strength in reality. 11th Air Assault Division's structure was planned to have three full-strength air assault brigades. In reality, the division had one air assault brigade and division artillery equipped with a rocket firing helicopter battalion. The 11th Air Assault Division's strength was 14,542 personnel.<sup>82</sup> The concept of the division was realized with partial replacement of ground vehicles by aviation assets, which were a part of divisional Air Assault Aviation group. The group had centralized control over all division's aircraft, which was enough to provide one-time lift to one third of combat units at a time. This was only a partial satisfaction of the Howze Board's requirements to make division 100 percent airmobile. Nevertheless, this number of aircraft was enough to provide training.<sup>83</sup> The division's Aviation Group included a surveillance and escort helicopter battalion, two assault helicopter battalions, an assault support helicopter battalion, and a general support helicopter company.<sup>84</sup>

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<sup>81</sup> Ibid., 259.

<sup>82</sup> Shelby L. Stanton, "Lessons Learned or Lost: Air Cavalry and Airmobility," *Military Review* (January 1989): 79.

<sup>83</sup> Horn, 260.

<sup>84</sup> Stanton, 79.

The same year 10th Air Transport Brigade was created as an experimental unit to support the 11th Air Assault Division. The brigade consisted of 3,541 men and 130 aircraft and served as a division's supplies delivering capability. It was capable of lifting 800 short tons to a distance of 175 miles each day.<sup>85</sup>

The entire concept of the division's air assault success was following: being independent from terrain and obstacles, it could achieve tactical surprise by quick and focused attack of enemy contemporary units. The 11th Air Assault Division conducted a number of experiments focused on the beneficial use of unique helicopter mobility capabilities providing greater flexibility to the forces. The army introduced 1 three-phased testing program for the 11th Air Assault Division on January 1963. Limited division resources dictated the method of conducting these tests. During the first phase the division was represented by a reinforced battalion and air transport brigade. Initial training went well and units involved created a nucleus for the following development. The second phase focused on the brigade level operations and started in November 1963. The final, third phase was to begin in October 1964 with a full division strength exercise to prove its ability to be involved in limited, medium, and full-scale nuclear war. However, this final stage was never completed due to the division's deployment to Vietnam.<sup>86</sup>

The conduct of exercises allowed units to gain experience and expose weak points of the concept. It was challenging to select a proper landing sites close to the objective.

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<sup>85</sup> Frank F. Rathbun, "Air Assault's Second Year," *Army* (May 1964): 14.

<sup>86</sup> Horn, 263-264.

Air assault forces possessed limited ground mobility. The limited size of a landing zone or a strong defense was the greatest concern. Suppressive fire support before and during landing operations was recognized as a true necessity. Moreover, there still were many opponents of vertical capabilities, who argued that helicopters were too vulnerable in combat and too limited by night and bad weather conditions. These comments motivated pilots to become better and they started practicing as realistically as possible flying at low-level and at night even in adverse weather.

During the tests there were two division level exercises to prove the validity of the concept. The Air Assault I exercise was held in September and October 1963 near Fort Stewart, GA. In late 1964 an Air Assault II exercise was conducted in North Carolina with an extensive two-sided maneuver against 82nd Airborne Division. The exercise continued for one month in a poor weather conditions and was successful. It verified the ability of air assault operations to be effective accomplishing their tasks in very unfavorable conditions.<sup>87</sup> These exercises were focused on the European and Middle East theater type operations. Moreover, the Army began accumulating experience from the Vietnam. The 11th Air Assault Division trained and equipped six helicopter companies to conduct tests in Vietnam. When the two-year air assault test was over, General Rich wrote his report to the Commanding General, Combat Developments Command providing an overview and recommendations. He argued the necessity of incorporating the airmobility capability such as the 11th Air Assault Division into the Army structure.

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<sup>87</sup> Shelby L. Stanton, *Anatomy of a Division: The 1st Cav in Vietnam* (Novato, CA: Presidio Press, 1987), 33.

He reasoned that vital maneuver capability of division was due to aircraft integration into the unit's structure, and provided delineation between different levels of airmobility:

First, an aviation unit can be given to a combat force on a temporary basis for a specific operation. This is equivalent to a corps truck company attached to a division for a one time move. Such an operation involves two separate staff working out detailed plans to integrate the SOP's and techniques of two separately trained organizations. The second level is represented by the organic aviation. This approach benefits from the unity of command, day-to-day training and intangibles such as esprit. But it is limited to a company lift capability; does not permit replacement of ground vehicles by aircraft; its equipment is not tailored to aircraft capabilities; and it could never represent the primary trust of the division. At the third level a much greater gain is possible when the organization is specifically trained and equipped to exploit the continuing close tactical integration of heliborne lift as a primary means of maneuver, accompanied by readily available aerial fires and by highly responsive aerial reconnaissance and support systems. In my opinion, the combat power offered at these three levels rises on a geometric, rather than an arithmetic scale, and only at the third level do we find a new potential in the tempo of operations, in range over extended distances and in freedom from heretofore formidable terrain obstacles.<sup>88</sup>

Subsequent increase of the U.S. involvement in Vietnam brought the decision to convert the 11th Air Assault (Test) into a combat division. The new division was re-designated as the 1st Cavalry Division. On 1 July 1965 1st Cavalry Division (Airmobile) was activated with a strength of 15,847 personnel and 335 helicopters.<sup>89</sup> 1st Cavalry Division brought a new dimension for a ground troops on the battlefield and proved the benefits of the airmobility concept. However, it did not change the nature of warfare and basics for individual soldiers to fight. The airmobile trooper had to be a well-trained infantryman first obeying the old rules of firefight.

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<sup>88</sup> Tolson, 56-57.

<sup>89</sup> 1st Cavalry Division History–Fort Benning, “1st Cavalry Division,” accessed 14 April 2016, [http://www.first-team.us/tableaux/chapt\\_07/](http://www.first-team.us/tableaux/chapt_07/).

Helicopters were widely used in the Vietnam and the 1st Cavalry Division was not the only unit benefiting from vertical capability. Many other units used attached airmobile assets in the similar manner and situations. They consider themselves as airmobile as the 1st Cavalry Division. In many cases these units experienced a great value of helicopters in the combat and even without official recognition as an airmobile they managed to perform very similar to units with organic air assets. However, Lieutenant General John J. Tolson wrote in his book: “Every commander instinctively knew that he could do certain things with ‘his’ Hueys that he couldn’t quite do with ‘somebody else’s.’”<sup>90</sup>

In Vietnam the 1st Cavalry Division participated in the majority of operations enjoying speed and surprise of helicopters that became a primary means of troops delivery for them. Helicopters allowed troops to engage enemy in place and time they choose keeping initiative on their side. With the help of helicopters 1st Cavalry executed search and destroy operations and long-range penetration operations as well.<sup>91</sup>

The success of air assault operations in Vietnam was driven by airmobility, surprise and firepower. Speed and surprise were priorities for air assault operations according to the U.S. Army’s doctrine for helicopter operations. Helicopters usually used preplanned routes that avoided enemy air defense weapons positions. Utility and transport helicopters were usually escorted by armed helicopters, which were also providing fire support acting as aerial artillery. Nap of the earth flying was a desired

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<sup>90</sup> Tolson, 84.

<sup>91</sup> Ibid., 86-88.

technique to gain surprise and minimize exposure to enemy fire.<sup>92</sup> To counter effective use of helicopters by the U.S. Army, the Viet Cong published a handbook: “Comments on Countering Heliborne Landings and Raids.”<sup>93</sup>

### The Second Airmobile Division

On 28 June 1968 the 101st Airborne Division was reorganized into the Army’s second airmobile division. Department of the Army decided to convert the 101st Airborne in December 1967, however it was impractical due to the lack of aviation assets during the buildup phase in Vietnam.<sup>94</sup> During the next year U.S. industry remediated a shortage of helicopters and finally the army was able to create a second airmobile division changing their parachutes in favor of helicopter-borne operations. To convert from the airborne to the airmobile configuration division developed three-phase plan. The first phase lasted six months and was over in December 1968. During this time, they activated 160th Aviation Group. The second phase was over in June 1969. An armored cavalry squadron was converted into an air cavalry squadron. Finally, during the last phase an aerial rocket artillery battalion was activated. During the conversion period the division conducted combat operations. In general, the reorganization went smoothly. To provide enough aerial mobility the 1st Aviation Brigade reassigned the 308th Aviation

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<sup>92</sup> Horn, 270.

<sup>93</sup> Ibid.

<sup>94</sup> Tolson, 196.

Battalion together with its support detachments to the 101st Airborne Division in July 1968. That was an essential airmobile reconfiguration of the division.<sup>95</sup>

### The 1st Aviation Brigade

In 1965, there was a rise of the U.S. Army's involvement in Vietnam. The use of aviation for support and transportation of ground troops grew a lot as well. This brought a necessity for the U.S. Army to gain means for tactical and administrative control over all of its aviation assets in Vietnam, which resulted in the creation of the 1st Aviation Brigade. Before the creation of the 1st Aviation Brigade aviation units were cooperating with local commanders supporting them by fire, moving units and supplies. Methods of cooperation were informal. Later it became challenging for helicopter units to support ground commanders in different geographic areas, where they did not have previous experience. The creation of the 1st Aviation Brigade brought a level of standardization for aviation training, procedures, and methods.<sup>96</sup>

In March 1966, the 1st Aviation Brigade was activated. It served in Vietnam from May 1966 until March 1973. At its peak strength, the 1st Aviation Brigade size was bigger than the entire air forces of many countries. It consisted of four aviation groups, 16 combat aviation Battalions, and 83 companies with more than 4,000 rotary and fixed wing aircraft and 24,000 personnel.<sup>97</sup>

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<sup>95</sup> Tolson, 195-197, 201.

<sup>96</sup> Ibid., 102.

<sup>97</sup> Ibid., 201.



During the Vietnam War, the 1st Aviation Brigade and its support units became involved in four major operations. The first was the Tet Offensive from January to March 1968. The second important operation was in April 1968, lifting the North Vietnamese Army siege of the U.S. Marine Corps' base at Khe Sanh. The operation successfully combined airmobile operations and a road march by 1st Cavalry Division and Marine Corps units. The next effective helicopter operation was the incursion of the American and South Vietnamese Armies into neighboring Cambodia in May 1970. The final large-scale operation was LAM SON 719 from January to April 1971. During this operation U.S. helicopters lifted South Vietnamese troops into Laos. Helicopter gun-ships provided combat air support and destroyed a number of North Vietnamese P-76 tanks. The results of this operation were controversial, because the Army suffered the loss of about 100 helicopters, the majority of which were shot down by the new Soviet-built antiaircraft guns. The operation served as a lessons learned report for the Army to reevaluate vulnerability of helicopters in combat. It also stressed on the need of a more-heavily armed helicopter available for a fire support.<sup>98</sup>

### Conclusions

The threat of a large-scale conflict in Europe in the age of nuclear weapons brought reevaluation of nuclear and nonnuclear capabilities balance in the U.S. Army structure. It provided understanding of the necessity of the vertical capabilities as a tactical mobility means. Land warfare mobility and potential use of helicopters in the

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<sup>98</sup> U.S. Army Aviation Museum, "1st Aviation Brigade Official History," accessed 18 April 2016, <http://www.1stavnbd.com/1sthistory.html>.

combat was accessed during the Rogers and Howze Boards. They provided the basis for Army aviation structure and authorized the creation of an airmobile division and air cavalry combat brigade. Moreover, the urgent need for aviation assets in Vietnam brought an enlargement of aviation units. The Howze Board resulted in the creation of the 11th Air Assault Division at Fort Benning in 1963. Subsequently, the 11th Air Assault Division in conjunction with the 2nd Infantry Division formed the 1st Cavalry Division, which had a primary mission to find and fix the enemy in Vietnam.<sup>99</sup> The next major step was the creation of the 1st Aviation Brigade in 1966, which standardized use of attached helicopters. The informal doctrine of airmobility and suppressive fire developed during the 1950-1960s in conjunction with the Vietnam War needs led to organizational changes. The conflict episode created favorable conditions and need for informal doctrine acceptance. If there were no sense of necessity changes in the Army aviation organization structure either could have been much slower or even would not have occurred at all.

The Howze Board did not create a new concept, but provided details and explanation how to develop existing tactics and techniques. The board accepted the concept of air cavalry as a replacement of old cavalry accomplishing its unique missions.

Development of new pieces of aviation technology such as UH-1 (Huey) and AH-1 (Cobra), which were introduced during the war in Vietnam, played a great role in

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<sup>99</sup> John Everett-Heath, *Helicopters in Combat: The First Fifty Years* (London: Arms and Armor, 1992), 79.

combat. However, technological development was not a factor that led to organizational changes.<sup>100</sup>

In 1960s the airmobility concept finally was brought into reality for the U.S. Army. The 1st Cavalry Division and the 101st Airborne Divisions became great examples of the beneficial use of this new type of tactical mobility. It gave units the unprecedented degree of flexibility and surprise. Divisions possessed their organic aviation, which made cooperation between ground units and aviation easy and natural. Unit commanders used “their own” aviation and not just attached elements. Furthermore, the 1st Aviation Brigade standardized operations of all other than organic aviation assets providing assigned helicopters to ground commanders. The airmobility concept was finally successfully realized and practiced in combat.

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<sup>100</sup> Law, 25.

## CHAPTER 6

### CONCLUSIONS

#### Summary

The Marines acted as an example of how vertical assault innovation must be developed? in the late 1940s and early 1950s. There were several factors that played a beneficial role in favor of the Marine Corps. Firstly, the changing nature of threat brought a sense of urgency, which was a precondition for rapid changes. Secondly, an innovation-friendly environment and good working relations with the U.S. Navy made it easier. Thirdly, public appreciation including senior military leadership and Congress brought a vision for the capability employment. Lastly, the state of technology was sufficient to conduct initial experiments and subsequent large-scale combat operations in Korea. The Marines' innovation with vertical assault was timely, adequate and creative. They created transport helicopter squadrons, which became a primary? organizational change for Marine Corps' aviation.

At the same period of time the Army did not take a proactive approach, which prevented it from early development and incorporation of the vertical capability. The Army joined the Korean War without possessing experience in helicopter application or even sufficient peacetime experiments with helicopters. It failed to innovate during the peacetime period. The army did not have a doctrine or field manual for helicopter application until 1957 and nothing but a working paper as guiding instructions in Korea. The lack of vision and direction was driven by the absence of a central agency with authority to develop, procure and implement helicopters. During the Korean War the Army looked at helicopters more as aerial trucks than new combat machines.

Between the end of the Korean War in 1953 and the start of U.S. involvement in Vietnam in 1960, the Marines' dream of an all helicopter assault never came true. Several factors, such as the immature state of technology, high procurement prices for helicopters, and need for a large number of expensive helicopter carriers to meet new assault concept, prevented vertical capability from desired development. During this period the Marine Corps was less progressive in helicopter innovation. However, they remained flexible enough.

During the interwar years the Army made two big steps towards organic airmobility. Firstly, it established a bureaucratic aviation organization at the Department of the Army, which provided the basis for organization, doctrinal changes and education. Secondly, the Army obtained partial control in the procurement of its own aircraft, logistical support of Army aviation and training of pilots. Moreover, there was an increase of capabilities within Army aviation. Nevertheless, despite the positive aspects, there still was a lack of vision, perspective, and priority for the helicopter inside the Army. Army leaders did not manage to develop a master plan and allocated not enough resources. Lastly, there was an extreme lack of support from the Department of Defense level.

During the 1960s and early 1970s the Army finally managed to develop and employ the airmobility concept. Military leadership understood the necessity of reevaluation a balance between nuclear and nonnuclear capabilities. Despite the involvement of the U.S. military in Vietnam, a sense of necessity for the vertical capabilities as a tactical mobility means came from the European theater endangered by the Cold War. The Rogers and Howze Boards held in the early 1960s provided the basis

for Army aviation structure and authorized the creation of an airmobile division and air cavalry combat brigade. Furthermore, the Howze Board did not create a new concept, but just explained how to develop existing tactics and techniques.

Furthermore, Army aviation units enlarged to meet the requirements of the U.S. military buildup in Vietnam. The 11th Air Assault Division was activated at Fort Benning in 1963 and subsequently, in conjunction with the 2nd Infantry Division, formed the 1st Cavalry Division. The 1st Aviation Brigade was activated in 1966 to standardize use of attached helicopters in Vietnam. That conflict created favorable conditions and need for acceptance of the informal doctrine developed during the 1950-1960s. It resulted in the organizational changes. Moreover, a lot of technological changes occurred during this period, however they did not play as a factor that led to organizational changes.

The 1st Cavalry Division and the 101st Airborne Divisions became great examples of the beneficial use of this new type of tactical mobility. They performed with great advantages, such as a high degree of flexibility and surprise. Cooperation between ground units and aviation became natural due to organic aviation in the structure of ground units and the airmobility concept was finally realized successfully and practiced in combat.

A certain state of technology sufficient for mission accomplishment is a “must have” for a capability employment. A particular capability, such as helicopters, needs to be develop during peacetime. Moreover, sufficient preparation, training, and practical exercises need to be conducted during peacetime as well. Two components need to be in place to employ any kind of innovation in the military. The helicopters were not an exception. First is an understanding, vision and will of the national and military

leadership. These can be developed by explanation and demonstration to prioritize and secure the capability in the minds of leadership. Secondly, each capability needs funding to conduct initial experiments and demonstration. In case of success this approach creates a political case to spend more. Fund allocation brings particular capability production and subsequent employment. Countries fight wars with capabilities they have at hand, not those being tentatively developed.

### Relevance of the study

The study provides a summary of the Army aviation development in the U.S. during 1950-1973. This period provides a clear understanding of the helicopter innovation process in the U.S. Army and provides basis for understanding of potential pitfalls on the way of changing doctrine, capabilities, tactics, and techniques of force application. These years emphasized on the unique role of helicopters in general and in combat as well. Lieutenant General John J. Tolson in his book *Airmobility* stated:

The keystone to airmobility was and is the helicopter and it is easy to forget the versatility and uniqueness of this vehicle. Many futile discussions have been held on the cost, ton-mile capacity, complexity, and limitations of the helicopter when either comparing it to the fixed-wing transport or other means of mobility. The simple fact is that no other machine could have possibly accomplished the job of helicopter. It alone had true vertical capability and could perform those scores of missions ranging from an insertion of a long range patrol to the vertical assault of an entire division; it alone could place artillery on the mountain tops and resupply this isolated bases; it alone could evacuate the wounded out of the chimney landing zone, surrounded by 100 foot trees; it alone could elevate the infantry support weapons and deliver that discreet measure of fire so dear to the survival of a squad. Only the helicopter could place a small bulldozer on a critical piece of terrain or extract another aircraft downed in the jungles and return it to fly again.<sup>101</sup>

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<sup>101</sup> Tolson, 104.

Here are some benefits of vertical capability use: speed, surprise, independence of terrain, and flexibility. That is why helicopters are still used in the military. Moreover, they have a great future perspectives on the modern battlefield. Nevertheless, there were some disputes of the vulnerability of helicopters on the battlefield. Nowadays the classic action-reaction-counteraction approach is used by different countries to balance counterpart capabilities. Helicopters have become better and more capable. New air defense capabilities emerge in response to this threat. To balance these capabilities, helicopters become equipped with new counter measures. It is a never ending story.

Moreover, the study can be used as an example for the innovation of different capabilities, showing that understanding and support from national and Department of Defense leadership is the basis for development and employment. General plan and budgeting are the next stage. For example, Ukrainian Army aviation is currently represented by Soviet-built helicopters. They are modernized domestically. However, this capability has its limits and in future there will be a need of vertical capability replacement either with home-designed helicopters or foreign-made ones.<sup>102</sup> To make this innovation step easier, the Ukrainian Army aviation leadership needs to gain higher leadership's understanding and support to have sufficient budget allocation. In this case the study can be used as an example to overcome lack of priority for helicopters in the Army.

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<sup>102</sup> "Ukrainian Military Helicopters-Modernization And Development Plans," accessed 1 May 2016, <http://www.defence24.com/269678,ukrainian-military-helicopters-modernization-and-development-plans>.



### Potential further developments of the study

Let's look at the potential continuation of this work. There are three potential direction for the topic development that seem to be very relevant as a natural extension of the study.

The first direction is a chronological extension to the period 1970-1990 or even up to 2010. This study can provide a look on the period after the Vietnam War. From the one hand, there was no more need for enormous size vertical capability in the Asian theater and rotorcraft aviation withdrew back to the U.S. From the other hand, the Cold War was just in its middle and military competition and force buildup was on its rise. It is an interesting topic to research and make comparison with the basic study conducted. The next period is 1990-2010, another very promising topic. After the collapse of the Soviet Union a huge global power rebalance occurred. That brought temporary relief to the U.S. and a decrease of its armed forces. However, technological advance gave new capabilities to the U.S. military and vertical capabilities used these advantages during war. These two decades were conflict-intense for the U.S. Probably, the study can be limited to the use of helicopters in the particular conflict or to provide an overview of all period without going deep into details.

Another possible study which looks even more promising is the development of the Soviet helicopter capabilities during the same period. The author provided a comparison of the U.S. Army and Marine Corps' approach towards vertical capability employment. To compare their approach with the Cold War opponent's approach would be extremely interesting. Potential fields for comparison include doctrine, technology, approach towards organic vs nonorganic aviation, composition of airmobile units, and

methodology of helicopter use on the battlefield. The study seems to cover a broad spectrum of knowledge and can be focused on the one of several aspects: employment of armored helicopters, land mobility vs helicopter mobility, composition of airmobile units.

The last field of potential study is the perspectives of helicopters in the U.S. Army. It is a complex topic by itself and needs to be narrowed down to more specific topics: technology (manned vs unmanned helicopter, helicopters vs convertiplanes), employment of the helicopters in the future warfare (conventional, nuclear, asymmetric), or helicopters in the future force structure. Furthermore, this topic needs to cover the 1970s-2010s to make it relevant.

## BIBLIOGRAPHY

- 1st Cavalry Division History–Fort Benning, “1st Cavalry Division.” Accessed 14 April 2016. [http://www.first-team.us/tableaux/chapt\\_07/](http://www.first-team.us/tableaux/chapt_07/).
- Bacevich, Andrew J. *The Pentomic Era*. Washington, DC: National Defense University Press, 1986.
- Bergerson, Frederic A. *The Army Gets an Air Force*. Baltimore, MD: The Johns Hopkins University Press, 1980.
- Bradin, James W. *From Hot Air to Hellfire: The History of Army Attack Aviation*. Novato, CA: Presidio, 1994.
- Butler, Howard K. *The Army Ground Forces and Helicopter, 1941-1945*. Saint Louis, MO: Historical Division, United States Army Aviation Systems Command, 1987.
- Cheng, Christopher. *Air Mobility: The Development of a Doctrine*. Westport, CT: Greenwood Publishing Group, 1994.
- Everett-Heath, John. *Helicopters in Combat: The First Fifty Years*. London: Arms and Armor, 1992.
- Galvin, John R. *Air Assault: The Development of Airmobile Warfare*. Portland, OR: Hawthorn Books, 1969.
- Gavin, James M. “Cavalry and I Don't Mean Horses.” *Harper's Magazine*, April 1954.
- Gregory, Hollingsworth F., Colonel. *Anything a Horse Can Do*. New York: Reynald and Hitchcock, 1944.
- Horn III, Carl John. “Military Innovation and the Helicopter: A Comparison of Development in the United States Army and Marine Corps, 1945-1965.” Dissertation, The Ohio State University, 2003.
- Howze, Hamilton H., Major General. “Future Direction of Army Aviation.” *Army* 7 (December 1956).
- Kitchens, John W. “Cargo Helicopters in the Korean Conflict.” *U.S. Army Aviation Digest* (November-December 1992): 12-23.
- Knox, Macgregor, and Williamson Murray. *The Dynamics of Military Revolution*. Cambridge, UK: Cambridge University Press, 2009.
- Law, David, Major. “United States Army Aviation Organizational Changes.” Monograph: School of Advanced Military Studies, 2012.

- Mersky, Peter B. *U.S. Marine Corps Aviation: 1912 to the Present*. Mount Pleasant, SC: Nautical and Aviation Publishing, 1997.
- Parker, Geoffrey. *The Cambridge Illustrated History of Warfare*. New York: Cambridge University Press, 1995.
- Raines Jr., Edgar F. "Organic Tactical Air Transport, 1952-1965." *Military Review* (January-February 2000): 84-92.
- Rathbun, Frank F. "Air Assault's Second Year." *Army* (May 1964): 11-23.
- Rawlins, Eugene W. *Marines and Helicopters, 1946-1962*. Washington, DC: History and Museum Division Headquarters, U.S. Marine Corps, 1976.
- Ridgeway, Matthew B. "An Army on its Toes." *The Army Combat Forces Journal* (December 1954).
- Shurcliff, William A. *Bombs at Bikini; the Official Report of Operation Crossroads*. New York: W. H. Wise, 1947.
- Stanton, Shelby L. *Anatomy of a Division: The 1st Cav in Vietnam*. Novato, CA: Presidio Press, 1987.
- Stanton, Shelby L. "Lessons Learned or Lost: Air Cavalry and Airmobility." *Military Review* (January 1989): 74-87.
- Taylor, Maxwell D. *The Uncertain Trumpet*. New York, NY: Harper and Brothers, 1960.
- Tierney, Richard. *The Army Aviation Story*. Northport, AL: Colonial Press, 1963.
- Tolson, John J. *Airmobility 1961-1971*. Washington, DC: Department of the Army, 1973.
- Wheeler, Howard A. *Attack Helicopters: A History of Rotary-Wing Combat Aircraft*. Baltimore, MD: Nautical and Aviation Publication Co. of America, 1987.
- Weinert, Richard P. Jr. *A History of Army Aviation - 1950-1962*. Fort Monroe, VA: Office of the Command Historian United States Training and Doctrine Command, 1991.
- Williams, James W. *A History of Army Aviation, from its Beginnings to the War on Terror*. New York: iUniverse, 2005.
- "Ukrainian Military Helicopters - Modernization And Development Plans." Accessed 1 May 2016. <http://www.defence24.com/269678,ukrainian-military-helicopters-modernization-and-development-plans>.
- U.S. Army Aviation Museum. "1st Aviation Brigade Official History." Accessed 18 April 2016. <http://www.1stavnbd.com/1sthistory.html>.